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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,600	06/24/2003	Oscar David Labrana Valdivia	09239.0001	1500

22852 7590 05/23/2005

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EXAMINER	
HERTZOG, ARDITH E	

ART UNIT	PAPER NUMBER
1754	

DATE MAILED: 05/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/601,600	LABRANA VALDIVIA ET AL.	
	Examiner	Art Unit	
	Ardith E. Hertzog	1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 January 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *27-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *27-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 January 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This action is in response to the "Reply to Office Action" (amendment) filed January 19, 2005. **New** claims 27-49 are now pending.

2. The objections to the drawings, as set forth in paragraphs 3.-6. of the prior Office action with mailing date July 19, 2005 (hereinafter "the 7/19/04 action"), have been **overcome** by amendment. **However**, note the **new** objections to the drawings made in response to said amendment set forth below. **In addition**, note that the objection to the drawings, as set forth in paragraph 7. of the 7/19/04 action (i.e., that corresponding to the previous PTO-948), has been **revised** in favor of that set forth below.

3. The objection to the claims, as set forth in paragraph 9. of the 7/19/04 action, has been **mooted** by amendment.

4. The objection to the disclosure, as set forth in paragraph 10. of the 7/19/04 action, has been **overcome/mooted** by amendment (noting that, with respect to point r. therein: "If, at the time of allowance, the quoted terminology [(i.e., 'The invention claimed is' (or the equivalent))] is not present, it is inserted by the Office of Patent Publication" (see MPEP § 608.01(m)). **However**, note the **new** objection to the disclosure made in response to said amendment set forth below.

5. The 35 U.S.C. § 112, second paragraph, rejections of claims 1-3, as set forth in paragraphs 12.-13. of the 7/19/04 action, have been **mooted** by amendment. **However**, note the **new** 35 U.S.C. § 112, second paragraph, rejection made in

response to said amendment set forth below.

6. The 35 U.S.C. § 102(b) rejection of claims 1-3 as being anticipated by Guth et al. (US 3,803,298), as set forth in paragraph 15. of the 7/19/04 action, has been **mooted** by amendment. In particular, none of new claims 27-49 corresponds in scope to original claims 1-3.

7. Similarly, the 35 U.S.C. § 102(b) rejection of claim 1 as being anticipated by Chatelain et al. (US 2,310,173), as set forth in paragraph 16. of the 7/19/04 action, has been **mooted** by amendment, since none of new claims 27-49 corresponds in scope to original claim 1.

Drawings

8. The **new** drawings are objected to, because:

a. In (Replacement Sheet) Figure 1, the symbols for both "3" and "4" have been deleted, as has the upper portion of both drawing elements corresponding thereto.

b. In (Replacement Sheet) Figure 2, the bottom half of the symbol for "FFIC 09" symbol has been deleted, as has the upper portion of the "AS" symbol .

c. In (Replacement Sheet) Figure 3, the symbols for both "6" and "3" have been substantially deleted.

d. In (Replacement Sheet) Figure 4, various lead lines and elements have been at least partially deleted.

9. Lastly, the drawings are again objected to, in accordance with the enclosed PTO-948 (i.e., that dated 5/9/05).

10. **Corrected drawing sheets, with amendment to the specification if/as necessary, are required in reply to this Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended". If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR § 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. Any objection to the drawings will not be held in abeyance.**

Minor Informalities

11. The disclosure is objected to, because of the following minor informalities:

a. In claim 27, the penultimate line, "sulfur" is misspelled.

b. In claim 27, the last line, "ration" should evidently be "ratio".

c. In claim 30, after "chamber", "is" should be inserted, for clarity.

Appropriate correction of all the above is required.

Claim Rejections - 35 U.S.C. § 112

12. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

13. Claim 47 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Said claim is considered vague, indefinite, and/or confusing, in that it is not clear which "elemental sulfur content" is being referred to in claim 27 (upon which claim 47 ultimately depends) – that for the "elemental sulfur" reactant or that in the resultant SO_2 product? Presumably it is the latter, but, again, such is not **clear**, especially as this limitation does not appear to be discussed in the specification (though present in originally filed claim 20 and so not new matter). Appropriate correction is required.

Claim Rejections - 35 U.S.C. §§ 102 & 103

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

15. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

16. Claims 27-29, 39 and 41-45 are rejected under 35 U.S.C. § 102(e) as being anticipated by Perez Garcia (US 6,875,413). Perez Garcia teaches a sulfur dioxide plant and method of operating same via steps which read upon the three recited in ***applicant's independent claim 27***, including the operating conditions recited at the end thereof (see abstract, in concert with Fig. 1, noting especially the "maintain combustion at less than 1200°C" limitation). Further note that the "less than 1200°C" limitation taught by Perez Garcia reads on not only the open-ended range of ***instant claim 27***, but also the narrower range of ***instant claim 39*** (i.e., "1200" falling within applicant's claimed narrower range). A range of recirculated SO_2 gas with midpoint the same as the specific value of ***instant claim 28*** is taught (see patented claim 7), as are the "cooling liquefaction unit" limitations of ***instant claims 42-45*** (see col. 1, line 66 – col. 2, line 11, noting: element 10 of Fig. 1; the corresponding negative temperature and pressure disclosed at lines 29 and 31, respectively, of col. 1; the corresponding "remaining 5-30%" range disclosed at line 65 of col. 1 (i.e., "a higher concentration of gaseous SO_2", per ***instant claim 44***), and the corresponding "around 20%" SO_2 value recited in patented claim 8); note that recycle of "oxygen not consumed", per ***instant claim 29***, is also taught (see again col. 1, line 66 – col. 2, line 1, wherein recycle of "unused oxygen" is discussed). Lastly, Perez Garcia also teaches a counter current flow sulfuric acid absorption tower, per ***instant claim 41*** (see again Fig. 1, noting element 6). Hence, Perez Garcia anticipates the aforementioned claims of applicant, because, as just discussed, each and every recited limitation is taught.

17. Claims 30-38, 40 and 46-49 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Perez Garcia. Perez Garcia is relied upon as set forth above, anticipating various claims of applicant. ***Instant claims 30-31*** are not similarly anticipated though, in that **specific** $S:O_2:SO_2$ weight ratios are not disclosed. **However**, it would have been obvious to one of ordinary skill in the art, at the time of applicant's invention, to have determined with minimum testing suitable $S:O_2:SO_2$ weight ratios, because, Perez Garcia at least implicitly teaches such ratios via the disclosure of suitable volume percentages of these three components (see, for example, col. 1, lines 25-29, noting that stoichiometric quantities of sulfur and oxygen reactants (i.e., per applicant's approx. 1:1 $S:O_2$ weight ratios) are taught at col. 1, lines 45-50), with routine optimization of **any** reaction parameter disclosed by Perez Garcia considered to have been within the level of ordinary skill. Likewise, ***instant claim 40*** is not anticipated by Perez Garcia, since this **specific** combustion temperature is not disclosed. **However**, it would have been obvious to one of ordinary skill in the art, at the time of applicant's invention, to have determined with minimum testing suitable combustion temperatures, because, as discussed *supra*, Perez Garcia teaches an open-ended range reading on that of instant claim 39 (upon which instant claim 40 depends), with, again, routine optimization of **any** reaction parameter disclosed by Perez Garcia considered to have been within the level of ordinary skill. Per MPEP § 2144.05 II.:

> Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 105 USPQ 233, 235 (CCPA 1955).

Perez Garcia also fails to teach the various regulation-control sensors/valves of ***instant claims 32-36***. **However**, absent contrary evidence, it is considered to have been obvious to one of ordinary skill in the art, at the time of applicant's invention, to have utilized **any** such regulation-control device in the Perez Garcia sulfur dioxide plant, because the corresponding efficiency benefits of such automation are considered to have been well known in the art. With respect to ***instant claim 37***, Perez Garcia teaches liquid sulfur temperature control "maintained by steam produced in a multistep heat exchanger post-combustion chamber" (see again Fig. 1, noting elements 4 and 13), although the temperature of 140°C (see col. 1, line 41)) is slightly above applicant's range of "between 130 and 135°C". **However**, absent contrary evidence, applicant's upper temperature is considered to have been *prima facie* obvious over the Perez Garcia temperature, because, per MPEP § 2144.05 I.:

> a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

With respect to ***instant claim 38***, Perez Garcia at least inherently teaches "oxidative combustion... produced from liquid sulfur... produced in the **atomizer** of the burner" (emphasis added) (see again Fig. 1, noting element 3) but fails to teach that the sulfur is thus "in a pulverized microdrop state". **However**, it would have been obvious to one of ordinary skill in the art, at the time of applicant's invention, to have determined with minimum testing optimal forms for the liquid sulfur resultant in the Perez Garcia processes, because determination of optimal forms of state for **any** reactant disclosed

by Perez Garcia is considered to have been within the level of ordinary skill. Lastly, although Perez Garcia teaches recovery efficiencies as high as 95% (see again abstract), the additional (im)purity limitations of ***instant claims 46-49*** are not disclosed. **However**, absent contrary evidence, such (im)purity limitations are considered to have been obvious to one of ordinary skill in the art, at the time of applicant's invention, because the goal of achieving as pure a product as possible is considered to have been well known in the art; **moreover**, Perez Garcia at least generally suggests higher recovery efficiencies via the corresponding discussion of tailoring same, "depending on different operating pressure and temperature conditions of the plant" (see col. 2, lines 5-11).

Response to Arguments

18. Applicant's arguments with respect to new claims 27-49 have been fully considered but must be deemed moot in view of the new grounds of rejection.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. This reference – cited in Perez Garcia – is considered cumulative to or less material than those previously cited.

20. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR § 1.136(a).

21. **A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is**

filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR § 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

22. Any inquiry concerning this communication or any earlier communications from the examiner should be directed to Ardith E. Hertzog at (571) 272-1347. The examiner can normally be reached on Monday through Friday (from about 8:00 a.m. - 4:00 p.m.).

23. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley S. Silverman, can be reached at (571) 272-1358. The fax phone number for the organization where this application is assigned is (703) 872-9306.

24. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. For any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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AEH
May 16, 2005